

A NEW SPECIES OF *APHODIUS* (COLEOPTERA: SCARABAEIDAE)
FROM SAND DUNES IN CHIHUAHUA, MEXICO

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In recent years much has been done on the ecology of sand dune areas in western North America. The insect fauna of some of these dunes has proven to be unexpectedly rich with a high percentage of endemics, many of which have not been described. The dunes from which the species of *Aphodius* described here was taken have not been extensively collected; they may prove to possess an extensive beetle fauna. This large, distinctive *Aphodius* species has not been recorded from any other locality which may indicate that it is endemic to these particular dunes, and, if so, it is probable that other endemic species exist there. The purpose of this paper is to provide a name that can be used in further sand dune studies.

Aphodius giulianii, new species

Figs. 1-4

Holotype.—Male, length 5.82 mm, greatest width 2.78 mm. Form elongate, elytra parallel sided, body somewhat dorsoventrally flattened (Fig. 1). Pale brownish yellow; head, pronotum, sutural interval of elytron, tibiae and tarsi dark yellowish red. Head smooth, shiny, lacking any trace of tubercles, fimbriate with long hairs from clypeal angle to eye, surface faintly alutaceous, finely punctured, punctures separated by 1 to 3 times a diameter; anterior margin of clypeus feebly emarginate medially, slightly reflexed, anterolateral angle broadly rounded. Pronotum broad, robust, surface smooth, shiny, faintly alutaceous, punctures on disc fine, separated by less than to 3 times a diameter, punctures becoming coarser and denser toward lateral margin; anterolateral angle rounded, lateral border feebly arcuate, distinctly margined, fringed with hair longer than scutellum, posterolateral angle broadly rounded, posterior border margined, fringed with hair shorter than scutellum. Elytron dull, strongly alutaceous, pubescent, pubescence very short on disc, becoming longer and denser toward lateral and posterior margins; lateral border fimbriate, hairs longer than scutellum; intervals flat, feebly, indistinctly punctured; striae weakly impressed, flat bottomed. Ventral surface smooth, shiny, metasternum punctate medially with oblique row of setae bearing punctures on each side of middle. Anterior tibia with apical spur laterally flattened, abruptly narrowed to apex, apex bent inward (Fig. 2); middle tibia with inner spur nearly straight, apex truncate with sharp tooth at inner angle (Fig. 3); apex of hind tibia fringed with long, unequal spines, apical spurs long, straight, slender, inner spur longer than

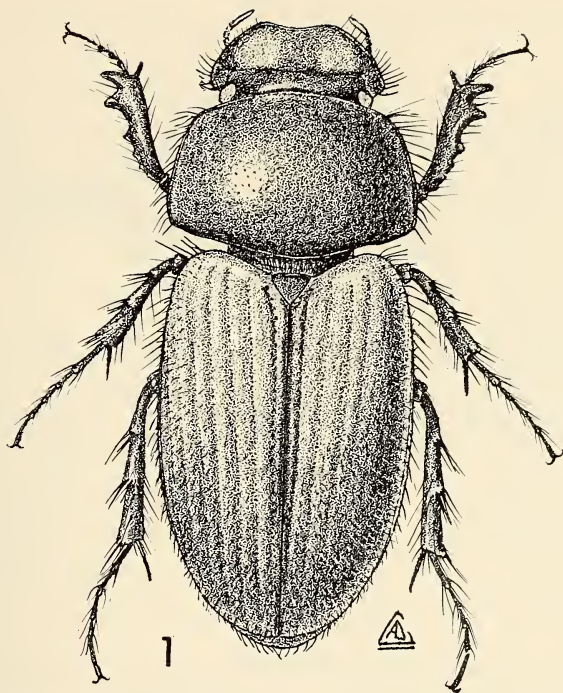


Fig. 1. Habitus of *Aphodius giulianii*.

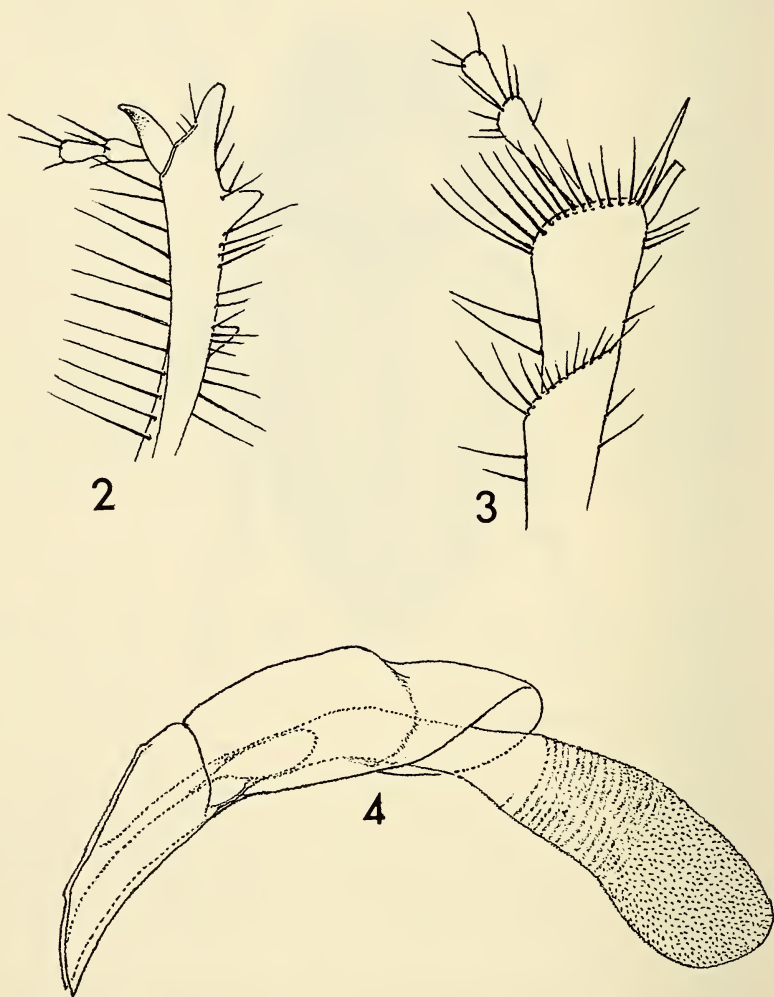
first tarsal segment, outer spur shorter than first segment. Anterior tarsus with first segment very short, 4 subsequent segments progressively longer, last segment as long as segments 3 and 4 combined; middle and hind tarsi with basal segment as long as segments 2 and 3 combined, segments 2 and 3 subequal, segment 4 short, segment 5 as long as 3 and 4 combined. Genitalia as in Fig. 4.

Allotype.—Female, length 5.41 mm, greatest width 2.49 mm. Similar to male except pronotum reduced in width, surface dull, strongly alutaceous; spurs on front and middle tibiae slender, unmodified.

Type-material.—Holotype, Mexico, Chihuahua, sand dunes 48 km S Juarez, 28-IV-1974, Derham Giuliani (USNM 73883). Allotype, same data as holotype (USNM). Paratypes, 8, same data as holotype, in collections of USNM and Alan Hardy, California Department of Agriculture, Sacramento.

Variation.—Length ranges from 5.0 to 6.0 mm, width from 2.35 to 2.81 mm. The surface of the pronotum varies from shiny to dull depending on the amount of alutaceous sculpture present.

Remarks: The Mexican species of *Aphodius* have not been taxonomically treated since they were included in the *Biologia Centrali-Americana* by



Figs. 2-4. *Aphodius giulianii*. 2, Front tibial spur; 3, Middle tibial spurs; 4, Male genitalia.

Bates (1887). I have examined representatives of all the described species of Mexican *Aphodius* and can state that the affinities of *giulianii* are not with those species but with a group known from the United States and Canada. This is Horn's (1887) Group L which is mostly restricted to North America from the Great Plains to the Atlantic Coast.

A. giulianii most nearly resembles *walshii* Horn and *femoralis* Say, but both of the latter 2 species have black, or nearly black, heads and a dark

median area on the pronotum. In addition, the elytral striae are deeply impressed on both species and the male tibial spurs are not at all like those of *giulianii*.

I have modified Horn's key to the species of Group L to include *giulianii*. *Aphodius tenuistriatus* Horn will probably be removed from the group when the entire genus is studied.

The species is named for Derham Giuliani in recognition of the prodigious amount of beetle collecting he has done in sand dune areas.

Key to species of Horn's Group L

1. Dorsum entirely rusty red; male pronotum not enlarged. 2
tenuistriatus Horn
- Dorsum not entirely rusty red; male pronotum usually enlarged. 2
2. Head and pronotum entirely black, elytra red. 3
rubripennis Horn
- Color pattern not as above. 3
3. Lateral margin of pronotum fimbriate with long hairs. 4
- Lateral margin of pronotum lacking hairs, or if hairs present, short and indistinct. 5
4. Head and pronotum dark brown to black, at least medially. 5
walshii Horn
- Head and pronotum pale brownish yellow throughout. *giulianii*, n. sp.
5. Elytron entirely pale except sutural stria dark, lacking pubescence. 6
- Elytron pale with darker, nebulous areas present, distinctly pubescent. 7
6. Punctures on pronotal disc sparse, separated by 2 to 3 times a diameter. 7
subtruncatus LeConte
- Punctures on pronotal disc dense, separated by less than a diameter. 7
rehni Robinson
7. Disc and anterior $\frac{1}{3}$ of pronotum densely punctured; elytron with narrow basal and sutural margins pale yellow. *femoralis* Say
- Disc and anterior $\frac{1}{3}$ of pronotum impunctate or with only a few scattered punctures; elytron yellow except large, irregular darkened area on disc, often extending to lateral border. *prodromus* (Brahm)

Knowledge of the habits and habitats of members of this group is incomplete. *A. prodromus* is the only imported European species in the group and is a general surface dung feeder most common in bovine dung. *A. tenuistriatus* is not infrequently collected in bovine dung in the southwestern United States, but that may not be its preferred habitat. I have collected large numbers of *A. walshii* in sheep dung in sand dune areas of North Dakota. *A. femoralis* is apparently a general surface dung feeder most often collected in the dung of horses and cattle. *A. rubripennis* is usually restricted to deer dung but will feed on sheep droppings or even horse manure on occasion. *A. subtruncatus* and *rehni* are rarely collected.

and their habits are not known. I have taken one specimen of *subtruncatus* in cow dung and another in a prairie dog burrow, but I consider these collections accidental and the preferred habitat unknown. Both *subtruncatus* and *rehni* are probably detritus feeders in the upper soil layer. The habits of *giulianii* are also unknown, and I suspect that it is also a detritus feeder restricted to sandy areas.

Literature Cited

- Bates, H. W. 1886-1890. *Biologia Centrali-Americana*, Insecta, Coleoptera. Pectinicornia and Lamellicornia. Vol. II, Pt. 2, pp. 1-432.
- Horn, G. H. 1887. A monograph of the Aphodiini inhabiting the United States. *Trans. Amer. Entomol. Soc.* 14:1-110.

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